

Abstract:

An organic device is provided, having a first electrode and a second electrode. A first organic layer is disposed between the first electrode and the second electrode. The first organic layer includes a first organic material, with a concentration of at least 50% molar, and a second organic material, with a concentration less than 50% molar. A second organic layer is also disposed between the first electrode and the second electrode. The second organic layer includes the second organic material, with a concentration of at least 50% molar, and the first organic material, with a concentration less than 50% molar. The first organic material may act as an n-dopant in the second organic layer, and the second organic material may act as a p-dopant in the first organic layer. Alternately, the first organic material may act as a p-dopant in the second organic layer, and the second organic material may act as an n-dopant in the first organic layer. Exemplary materials for the first and second organic materials include PTCDA and BTQBT. Devices that may be fabricated include organic light emitting devices, organic transistors, and organic photosensitive devices. Preferably, the electron affinity of the first organic material is within about 0.4 eV of the ionization potential of the second organic material, and more preferably within about 0.2 eV. The first and second organic layers may also be used in separate devices fabricated on the same substrate. A method of fabricating devices is provided, by co-depositing the first and second organic materials at different concentrations in different layers, such that a different material is the host in different layers.